

Records of the exotic damselfly *Ischnura senegalensis* (Rambur, 1842) from Bonn (Germany)

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Abstract. We report on specimens of the damselfly *Ischnura senegalensis* (Odonata: Zygoptera: Coenagrionidae) accidentally introduced to western Germany. The odonates were encountered in Bonn and their origin could clearly be correlated with commercially distributed exotic aquarium plants.

Zusammenfassung. Wir berichten über Exemplare der Kleinlibelle *Ischnura senegalensis* (Odonata: Zygoptera: Coenagrionidae), die irrtümlich nach Westdeutschland verschleppt wurden. Die Libellen wurden in der Stadt Bonn gefunden und ihre Herkunft konnte zweifelsfrei mit kommerziell erhältlichen exotischen Aquariumpflanzen in Verbindung gebracht werden.

Key words. Anthropogenic dispersal, Coenagrionidae, globalization, North Rhine-Westfalia, Odonata, Zygoptera.

The Marsh or Senegal Bluetail, *Ischnura senegalensis* (Rambur, 1842), is a common member of the Coenagrionidae (Odonata: Zygoptera). Its natural distribution ranges mainly through an old world tropical and subtropical belt south of about 35°N from Africa to Japan (Askew 2004; Shama 2010). This species occurs in a variety of habitats and is tolerant of disturbances and pollution and therefore assessed as of Least Concern (Shama 2010). The N-most native occurrences in countries adjacent to Europe are in Algeria, Egypt, Iran, Iraq, Israel, Jordan and the Palestinian territories (Shama 2010). However, there are three isolated published reports of this species far outside its natural range. These are from S Finland (Valtonen 1985), S Great Britain (Brooks 1988) and E Germany (Kipping 2006), and could all be correlated with imported exotic aquatic plants.

On May 13, 2011 one of us (HS) encountered a living damselfly in his bathroom (Theodor-Brinkmann-Straße, 53115 Bonn, Germany) (Fig. 1). A first attempt to identify this specimen with standard literature for central Europe (Dijkstra & Lewington 2006) allowed to assign it only up to *Ischnura* Charpentier, 1840.

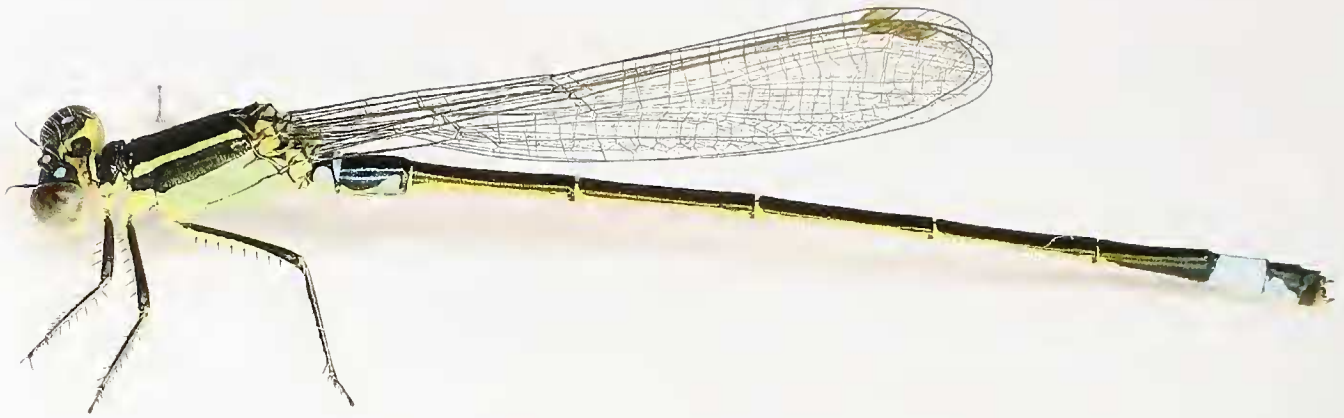
So far, there have been records for only two species of this genus from around Bonn: *I. elegans* (Vander Linden, 1820) and, although rare, *I. pumilio* (Charpentier, 1825) (le Roi 1915; Buchholz 1950; Schmidt 1990). Consulting Belle & Tol (1990) and Samways (2008) finally revealed – based on the the shape of the pronotum and the markings of S2 and S7-10 – that the present specimen is a male of *I. senegalensis*. As already mentioned, this is primari-

ly a tropical and subtropical species. The only explanation for its occurrence in this part of Europe was, especially in light of the previously reported irregular records, the aquarium in the hallway of the apartment. A subsequent control of that aquarium and its plants indeed revealed the respective exuvia and another, but dead, larva of this species (Fig. 2). These vouchers are deposited in the odonate collection of the Zoologisches Forschungsmuseum Alexander Koenig (ZFMK no. pending).

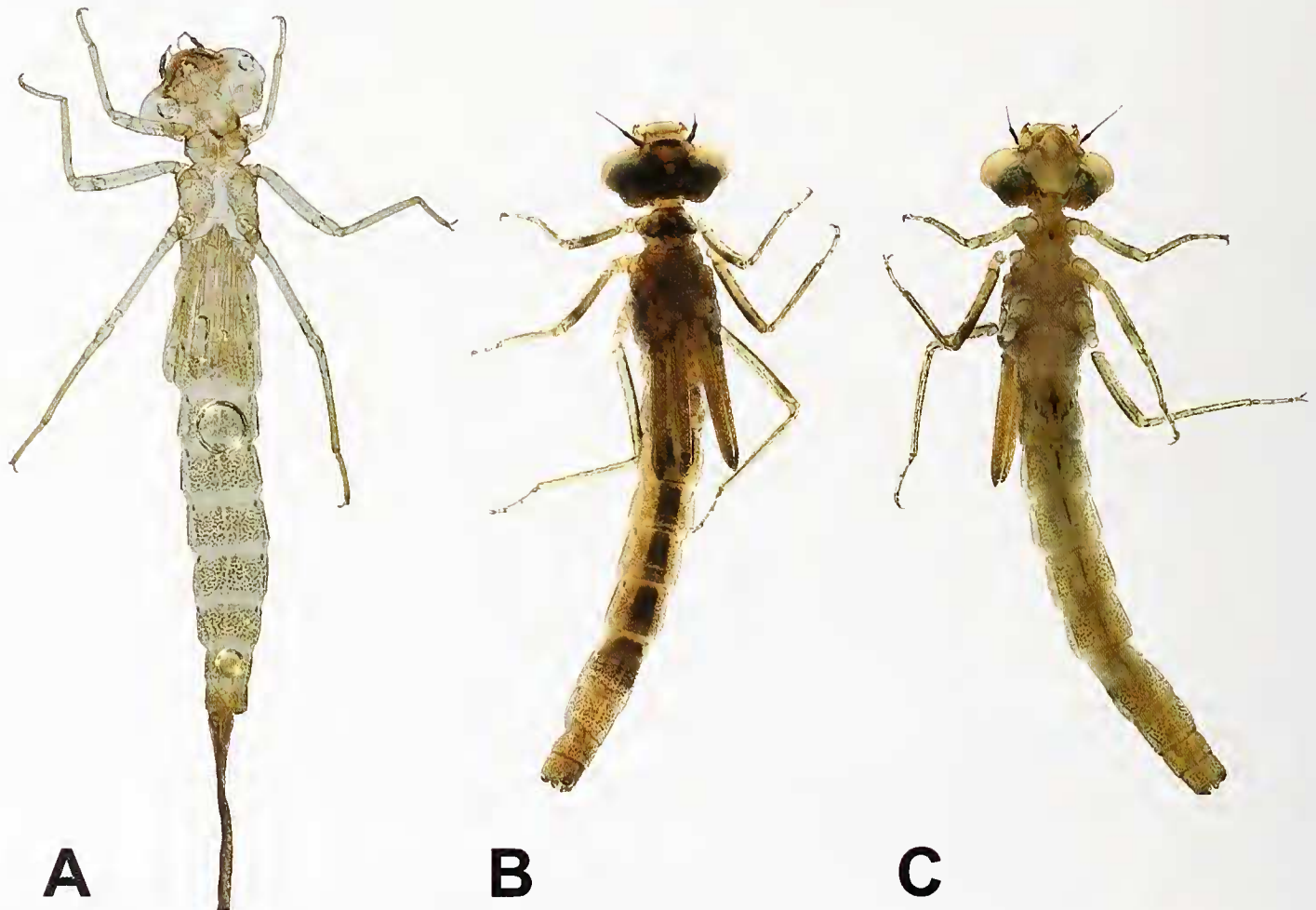
The aquarium, with a capacity of 54 l, had been set up in early April 2011 and the average water temperature was kept at approximately 23,5°C. Until the discovery of the damselfly there had not been any fish in the aquarium as it was used as a backup basin for an ongoing experiment on sound production in fish. There were only three species of plants in the aquarium, one of which (*Ludwigia repens* J.R. Forst) belongs to a genus which has been reported as a suitable microhabitat for coenagrionid larvae in general, and *I. senegalensis* in particular (Osawa & Katsuno 2003).

The plants were bought all together from a local pet store (Fressnapf Bonn-Endenich, Immenburgstraße 38, 53121 Bonn, Germany) in the second week of April 2011. Due to multiple and also changing wholesalers for this store, it was impossible to determine the exact origin of the plants. However, consultation of the store's fishkeeping department revealed that there had been isolated reports of unidentified odonate larvae in the past.

The herein described mode of dispersal for *I. senegalensis*, as being caused by imported aquarium plants, is in



Figs 1. The voucher of *Ischnura senegalensis* (male, in live) from Bonn, Germany (ZFMK no. pending). Photograph: M. Lambertz.



Figs 2. Exuvia from ventral (A) and larva from dorsal (B) and ventral (C) of *Ischnura senegalensis* from Bonn, Germany (ZFMK no. pending). Photographs: M. Lambertz.

complete agreement with the previous reports from Europe (Valtonen 1985; Brooks 1988; Kipping 2006). In an earlier study from Bonn, Schmidt (1990) also reports on unidentified specimens of *Ischnura* from the greenhouse in the botanical garden, which were assumed to have been

imported together with aquatic plants from Cameroon. Nevertheless, this is the first verified record of *I. senegalensis* from W Germany, the second for entire Germany and the fourth for central and N Europe.

Fortunately, there are yet no indications that such accidentally imported tropical and subtropical odonates have survived in the wild in Europe (Dijkstra & Lewington 2006; Kipping 2006). Conze et al. (2010), however, have considered the increasing average temperatures due to recent climatic change as the main reason for an increased spread of thermophilous dragonflies in North Rhine-Westphalia. Similar reports for a temperature dependent invasion of odonates exist for other parts of Germany and Europe as well (Goffart 2010; Knijf & Anselin 2010; Termaat et al. 2010; Ott 2010). Also for Bonn, there is a conspicuous increase in average temperature evident (SBASW 2002) and there is at least one attractive breeding place for odonates within the city limits (Schmidt 1990), only in about 1 km linear distance from the present record of this potentially invasive species.

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REFERENCES

- Askew RR (2004) The dragonflies of Europe. revised ed. Harley Books, Colchester
- Belle J, Tol JV (1990) *Anomalagrion hastatum* (Say), an American damselfly indigenous to the Azores (Odonata, Coenagrionidae). Tijdschrift voor Entomologie 133: 143–147
- Brooks SJ (1988) Exotic dragonflies in north London. Journal of the British Dragonfly Society 4: 9–12
- Buchholz KF (1950) Zur Paarung und Eiablage der Agrioninen (Odonata). Bonner zoologische Beiträge 1: 262–275
- Charpentier T de (1825) Horae Entomologicae (Neuroptera, Orthoptera, Coleoptera). A. Gosohorsky, Wratislavia
- Charpentier T de (1840) Libellulinae Europaeae – Descriptae ac Depictae. Leopold Voss, Lipsiae
- Conze K-J, Grönhagen N, Lohr M, Menke N (2010) Trends in occurrence of thermophilous dragonfly species in North Rhine-Westphalia (NRW). Pp. 31–45 in: Ott J (ed.) Monitoring Climatic Change with Dragonflies. BioRisk 5
- Dijkstra KDB, Lewington R (2006) Field Guide to the Dragonflies of Britain and Europe. British Wildlife Publishing, Dorset
- Goffart P (2010) Southern dragonflies expanding in Wallonia (south Belgium): a consequence of global warming? Pp. 109–126 in: Ott J (ed.) Monitoring Climatic Change with Dragonflies. BioRisk 5
- Kipping J (2006) Globalisierung und Libellen: Verschleppung von exotischen Libellenarten nach Deutschland (Odonata: Coenagrionidae, Libellulidae). Libellula 25: 109–116
- Knijf G De, Anselin A (2010) When south goes north: Mediterranean dragonflies (Odonata) conquer Flanders (North-Belgium). Pp. 141–153 in: Ott J (ed.) Monitoring Climatic Change with Dragonflies. BioRisk 5
- Osawa S, Katsuno T (2003) The relationship between the distribution of a vulnerable species *Ludwigia peploidea* ssp. *stipulacea* and an inhabitation of Coenagrionidae in urban river. Journal of the Japanese Society of Revegetation Technology 29: 343–351
- Ott J (2010) Dragonflies and climatic change – recent trends in Germany and Europe. Pp. 253–286 in: Ott J (ed.) Monitoring Climatic Change with Dragonflies. BioRisk 5
- Rambur JP (1842) Histoire naturelle des Insectes. Neuroptères (Suites à Buffon). Roret, Paris
- Roi O le (1915) Die Odonaten der Rheinprovinz. Verhandlungen des Naturhistorischen Vereins der preußischen Rheinlande und Westfalens 72: 119–178
- Samways MJ (2008) Dragonflies and Damselflies of South Africa. Pensoft Publishers, Sofia
- Schmidt E (1990) Libellenbeobachtungen in der Stadt: Der Botanische Garten Bonn. Tier und Museum 2: 42–52
- Shama G (2010) *Ischnura senegalensis*. In: IUCN Red List of Threatened Species Version 2011.1. Online at <http://www.iucnredlist.org> last accessed on June 16, 2011
- SBASW [Stadt Bonn, Amt für Statistik und Wahlen] (2002) Jahrestemperaturen in Bonn seit 1895. Bonner Monatszahlen 22: 1 [not paginated]
- Termaat T, Kalkman VJ, Bouwman JH (2010) Changes in the range of dragonflies in the Netherlands and the possible role of temperature change. Pp. 155–173 in: Ott J (ed.) Monitoring Climatic Change with Dragonflies. BioRisk 5
- Valtonen P (1985) Exotic dragonflies imported accidentally with aquarium plants to Finland. Notulae Odontologicae 2: 87–88
- Vander Linden PL (1820) Agriones Bononienses descriptae. Typographia annesii de nobilibus, Bononiae